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it is a mortifying fact that the early explorers in this country generally found welcome and hospitality among the Indians before the white traders had corrupted them. Now it is difficult to find a tribe that a white man cares to visit unless with the balance of power on his side. Indian cunning even has not proved equal to the duplicity of the white man. You may have heard of the Indian who offered his beaver skins for sale to a trader in olden times in one of our Puritan villages, when the trader was on his way to church. The trader would not purchase then, but in a whisper stated a price. When the church was dismissed the Indian followed the trader home and demanded payment for his skins, but was forced to accept a less price than was first named. The Indian took the money but told an acquaintance that he had discovered the use of the big meeting at the church,—"it was to lower the price of beaver skins."

As a white man I take the side of the pioneer in defence of his family, but I wish the Indians could have been spared much of the degradation brought upon them by bad white men that must eventually end in complete subjection, or extermination.

NOTE. All the figures not otherwise designated, are drawn from memory.—EDS.

THE TIME OF THE MAMMOTHS.

BY PROF. N. S. SHALER.

WE must ask the reader to go with us into the remote past; back beyond the time when man invaded the primitive forests and disturbed the abundant life which covered the prairies around the great inland seas of our continent; still farther back until we come to a time when very different animals from those now living there, roamed those woods and fields. We thus come to a time remote when measured by the usual standards of duration, yet only a geological yesterday. Once such journeys as we propose making were very difficult, and attended with dangers to soul, if not to body, which might well make any but the stout hearted investigator hesitate. But now that the wall, which once divided the preadamic time from the present, has been so frequently breached and trodden over by those bound on expeditions into an even more remote past than that to which we seek to penetrate, we may set out on our journey without fear of meeting with a reception, on our return, which might make us wish that we had stayed among the monsters of that ancient time.

We will not strain the imagination of the reader by asking him to conjure up a picture of land and sea unlike that given by our present continents and oceans. He need not flatten out mountain chains, or dry up river systems, in order to represent to himself a true picture of the theatre which bore the actors of the scenes we are about to describe. Our good old continent was much the same then as now. All the changes which have taken place would fall within the limits of error of the maps of the past few decades. The unceasing agents of change operating through water, have done much work; but a little longer delta to the Mississippi, a somewhat greater projection of Florida to the southward, a lessened area of the great lakes of the north-west, are about all the more important changes which have been accomplished since the time of which we speak.

In order to come in contact with living elephants and mastodons, we need not go so far into the history of our continent as to traverse the glacial period. Long after the time when this great ice envelope shrouded the northern half of this continent, the great pachyderms continued to form the most important feature in the life of our continent. If we wish to go back to the time when these great animals first came into our fields and forests we must ascend much farther into the past, beyond two or more glacial periods, with the long intervals of repose between them. During the middle and later tertiary periods elephantine life had its highest development; a half a dozen or more species lived then on the surface of the European continent, and only a portion of the then existing forms may be known to us. The importance of the elephant life of this time may be better estimated by comparing the number of large mammals belonging to any one family now existing in the same area. Only three or four species of the family of cervidæ, to which the common deer belongs, have existed in Europe since the glacial period. Among the bulls not more than two species are known to have lived during the same time. Nor among the large carnivora, the bears or wolves, have the species been more numerous. We must seek among the smaller of the existing mammals, among the squirrels or mice, for the same richness in specific representation as we find among the elephants of the tertiaries. The variety in size and form seems to have been very great; the smallest species was not over three or four feet high, while the largest stood as high as any of our living elephants, towering to the height of ten or twelve feet. We know too little of the geology of the other continents of the old world to say whether this exceeding richness in large elephants at this stage of the earth's history was also found there. We know, however, that India, where one of the two remaining species of elephants lives, was thronged with these animals at this time, and although Africa was probably then separated from the other continents with which it is now closely united by seas of considerable width, it, too, probably bore an abundance of the same life. We do not know the character of the life of the middle tertiary time in North America with anything like the accuracy that we do that of Europe during the same time. The investigations which are to enable us to form a clearly defined picture of the life of that time, on our own continent, are yet to be made. It seems likely, however, that during the time when elephants were so remarkable a feature in the life of the old world, the new world was inhabited by quite different forms of pachyderms. The beds of the Mauvaises Terres, and neighboring country so astoundingly rich in animal remains, have supplied us with more species of fossil horses than are known from all the rest of the beds of that period. Altogether the middle and later tertiaries of North America have supplied us with the remains of at least ten species of fossil horse-like animals; so that the comparatively unexplored regions of North America have yielded more tertiary horses than all of every age and formation which have been found in other regions.

When we come down to dates nearer to our own time, and only separated therefrom by the last ice period, we find evidences that the European elephantine life still continued, though the species had changed, there being no longer so considerable a number of distinct forms as then existed. We are not yet quite certain whether the elephant remains of Siberia come down to us from a period anterior to the glacial epoch, or whether they were stored away in that frozen soil during or since that time of extreme cold. All analogy with the remains found in other regions, lead us to conclude that these herds of elephants, whose remains are found in such abundance around the mouths of the great rivers of northern Asia which empty into the Arctic Ocean, are contemporaneous with those of the closely allied, if not identical, species found in the peat swamps and morasses of North America. The number of these fossil elephants which are to be found in northern Asia is as remarkable as the condition in which they have been preserved. The ivory which they have left strewn over this region has been for centuries an important article of commerce, a large portion of the Chinese supply being probably derived from this source. There can be no doubt that the elephant life of this region was once as abundant as that which now exists in the jungles of Ceylon, or the southern part of Africa.

The peculiar circumstances under which many of the bodies of the Siberian elephants have been preserved, enables us to form an idea of the external form and habits of the creature far more satisfactory in its character than that which we have of any other extinct animal, except a few which have been exterminated by the hand of man.

Generally the geologist is compelled to effect the restoration or rebuilding of the form of the extinct animal from fragments of a skeleton, the gaps of which he must fill by inference, and this conjectural framework is afterwards to be thrown into a more or less imaginary outline of soft, enveloping parts. He is only too thankful if he finds that decay has left him a tolerably fair basis which he may build his labor upon. But in the case of many of the Siberian elephants the preservation is perfect; not only the skeleton, but the whole mass of the soft parts; the external envelope of skin, with its protecting covering of hair; even the delicate and perishable structures of the eye, an organ which so quickly perishes when decay begins to work, are all in an unchanged condition. Nor is the preservation that of form alone; the chemical condition of the body is unchanged, it is still flesh and blood; its imprisonment in the ice of the frozen soil of the Lena delta for an hundred thousand years, more or less, has not perceptibly changed its constitution; animals feed greedily on this flesh which has endured twenty times as long as the historical record. The dogs and wolves gather from afar to the feast whenever one of these bodies is uncovered, and there seems no good reason why those abnormal appetites of Paris, which find a new titillation of the palate in every monstrosity of diet, should not get a sweeter morsel from these preadamic elephants than they have obtained from their choice pieces of the knackers yard. Fortune certainly awaits the next rival of the *hois treres Provenceaux*, if he will bid for it with elephant steaks from Siberia. The many ingenious inventors, who seek to find a means of preserving substances liable to perish by decay, who are constantly endeavoring to solve the problem of how to bring the surplus food of South America to the hungry mouths of Europe, may take a profitable lesson from these Lena elephants. Freeze the object to be preserved from decay in a block of ice; retain this in a frozen state and the entrance of the dreaded agents of change is at once barred. The conditions of permanent preservation are obtained; air is excluded; that which is within the substance is locked with the water and can act no farther. These are the simple conditions which have kept the Lena elephants unchanged, while the very vegetation which supported them has been swept away; and by observing these conditions we might have preserved the body of Cæsar himself unchanged to the present day. Who knows but that following the simple method here indicated, the forms of the illustrious dead may yet be preserved from generation to generation, giving a tangible chain to connect the too forgetful present with the past. What could so preserve the memory of a time as one of its chief actors sleeping before our eyes cased in crystal ice? Would not the world be richer if we could have before us the earthly habitations of a Dante, a Shakspeare, or an Humboldt, as they were left by their immortal selves? He who entered the cold depositaries of such precious relics could not come forth without feeling that he was closer wedded to a distant past than ever before. The author does not feel free to advise this Siberian treatment of our ancestors, as he is not sure but death should be followed by decay; but to those who think that the closer our relation to the past the better fitted we are for the work of the present, it must commend itself.

But to return to our elephants. The peculiar interest which is attached to the discovery of the well preserved remains of the only one of these animals which has come under the eye of a naturalist, warrants the transcription of the whole statement of the circumstances of its discovery.

This important discovery was made by the Chief Schumachoff, of the wandering tribe of Tunguzes, near the mouth of the river Lena. The following account is translated and condensed from the description published in the "Memoirs of the St. Petersburg Academy of Sciences."*

"In 1799 he built a cabin for his wife on the borders of the Lake Oncoul, and then went to search on the shore of the northern sea, hoping to find some elephants tusks. One day he perceived in the midst of the ice cliffs a shapeless mass, which did not look like the heaps of drift wood which are often found there. In order to examine it more nearly, he came ashore and observed the object on all sides, but could not recognize what it was.

The following year he discovered at this point a sea cow, and saw at the same time that the mass which he had seen before was farther separated from the ice, and showed two long projections, but he could not yet determine what it was. Towards the close of the following summer the whole side of the animal and one of the tusks projected beyond the ice wall of the cliff. On his return to the shores of Lake Oncoul he communicated the result of this discovery to his wife and to some of his friends; but their way of looking at the matter gave him much distress. The old men told him that they had heard their fathers say that once before a similar monster had shown itself on the same peninsula, and that the discoverer and all his family perished soon afterwards. The mammoth was consequently looked upon as an augury of a dire calamity, and the Chief was so much affected that he fell very ill; but at last, being a little convalescent, his first idea was of the profits he might gain by selling the tusks, which were of extraordinary beauty and size. He gave orders to have the locality carefully concealed, and all strangers turned away on some pretext, charging at the same time some of his people to watch carefully that no one should steal his treasure.

But the summer was less warm than the preceding, and the mammoth remained buried in the ice which scarcely melted at all. At last, towards the close of the fifth year, the ardent desires of Schumachoff were happily accomplished. For that part of the ice which was between the ground and the mammoth having melted more rapidly than the rest, the surface became sloping, and this enormous mass, pushed by its own weight, slid down and sorted on a bank of sand upon the shore.

In the month of March, Schumachoff came to his mammoth, and having cut off his tusks sold them to a merchant for goods worth fifty roubles.

Two years afterwards, consequently soon after the discovery of the mammoth, and fortunately in travelling through this country I was able to establish these facts which one would have believed so improbable. I found the mammoth still in the same place, but entirely mutilated. The Jacutes of the neighborhood had cut up the flesh and fed it to their dogs during a period of scarcity, and the wild animals, white bears, wolves, gluttons and foxes had picked the bones. The skeleton, almost entirely stripped of the flesh, was still entire with the exception of one forefoot. The spine from the head to the coccyx, a shoulder blade, the pelvis and the remains of the three extremities were still attached by cartilage. The head was covered with a dry skin. One of the ears was very well preserved, and furnished with a tuft of hair. All these parts have naturally suffered by transportation for a distance of eleven thousand werst. Still the eyes have been preserved, and in the left the ball is still visible. The brain remained in the skull, but seemed somewhat dried. The parts the least injured are one front and one hind foot; they were covered with hair, and had still the soles. According to the assertion of the Chief the creature was so fat that the belly hung down to below the knees. *The neck bore a long mane.* The skin, of which I collected about three-quarters, is of a dark gray color, covered with wool and black hair.

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*De Skeleto Mamonteo Siberico ad maris glaciales littora anno 1797 efosso, Auctore Tilesio. Mem. Acad. Imp., St. Petersburg. Tome v.

The escarpment from which the mammoth had slid had a height of from two hundred to two hundred and fifty feet, and is composed of clear, pure ice. It slopes towards the sea and its summit is covered with a coating of moss and friable earth about eight inches thick. During the heat of summer a part of the crust melts, but the rest remains frozen. Curiosity caused me to climb two other hills somewhat away from the shore. They were composed of ice also, and less covered with moss. At various points one saw fragments of wood of great size, and many tusks of mammoths imbedded in the ice precipices."

The peculiarities of the geographical distribution of organic life makes us associate certain animals and plants with certain features of climate. So that the inference was naturally made that the remains of elephants and rhinoceroses indicated a climate of a tropical character in the region where they are found at a time when these extinct species were living. That this is entirely fallacious is sufficiently proven by the fact that our Lena elephant is fitted to resist just such a temperature as now prevails in the regions where his remains are found. The hairy envelop afforded a non-conductor such as does not exist on the skin of any living animal outside of the Arctic circle. In place of the imperfect hairy covering of hairy pachyderms, or the bare skin of his living congeners, this elephant was provided with three distinct suits of hair and wool, the longest bristle-like hairs having various lengths up to a foot and a half, and serving the ruder purposes of defence; the next and shorter coat was a close set, tolerably fine hair, three or four inches long; within this, in itself a considerable protection against the weather, lay a coating of wool, fitting the intervals between the other hairs, and enabling the animal to withstand the greatest rigor of the climate, which now prevails in this part of Asia. Acute observation has supplied us with another evidence of the fitness of this elephant to live in the ordinary conditions of high latitudes. In the tooth of the specimen, before described, was found a morsel of wood, the remains of the last meal made by the creature; the microscope of the botanist showed this fragment to belong to a coniferous tree, so that the stunted furs of the high north might have supplied food for herds of these mammoths. It is not, however, quite certain that these animals ever came down to the borders of the northern sea, though, as we have seen, they were fitted for such a climate as now prevails there; so far as we know the remains which are found around the mouths of the great rivers of Siberia are always in a position, which seems to indicate that they have been swept into their places by the river, and may thus have come from any point on its course. The fact that spring overtakes the stream at its headwaters, filling its channel with the floods of the annual melting, while the region near the estuary may be still frozen solid, renders these Siberian rivers, as all other streams which flow towards higher latitudes, peculiarly liable to destructive overflows. Overtaken by these inundations these clumsy inhabitants of this region were swept down towards the sea and stranded on the perpetually frozen soil of the shore; here buried in the mud and ice they soon became frozen, and each successive inundation thickened the sheet of ice and frozen soil which sealed them from decay. Nothing but a change of climate or an alteration in the course of the stream in such fashion as to disinter the remains can ever disclose the innumerable bodies of these ancient monsters which lie stark and stiff along the waters of that frozen sea. When the frequent disinterment of these valuable fossils, by the falling of the frozen cliffs of the rivers of Siberia, are more closely watched, we will doubtless obtain similarly preserved bodies of the other large mammals which were contemporaneous with these elephants. It would be contrary to all analogy to find that these great pachyderms held these vast steppes of Siberia unassociated with other large mammals. We may reasonably expect to find a whole fauna of creatures fitted to the rude conditions to which we have seen this elephant is adapted.

Unfortunately we know too little concerning the fossils of the extreme northern part of North America to be able to say whether the Siberian elephants were peculiar to the Asiatic border of the Arctic Ocean, or extended over the northern part of this continent. All analogy in the distribution of life around that sea, at the present day, would lead us to expect that the same, or allied species, ranged all along our northern shore. The Mackenzie River being subject to just such a peculiar overflow as has embedded the elephants of Siberia in ice, we can hope that when its shores are better known there will be similar fossils found there. There seems to have been an obscure tradition among some portions of the Indians of eastern North America, that on the unexplored and distant recesses north of Lake Ontario and the St. Lawrence, there dwelt some great mammals which had a size like that of the elephant. With the early voyagers this was accepted as proof that the mammoth still lived in the western part of Labrador; and on some of the first maps this territory was laid down as the habitation of these surviving members of the giant race whose bones strewed the surface of so large a portion of the continent. It is to be expected that the Indians, who must from time to time have encountered skeletons of the mastodon and elephant where they had been unearthed by the changes of river courses, or brought to light in their efforts to free the obstructed course of large springs, such as those at Saratoga or Big Bone Lick, would have believed the species still living, and have assigned it a home in some distant region. A savage conceives with difficulty the extinction of any species of large animal, but if it fails to cross his path is disposed to assign it a home in the region least known to him.

So far as is known to the author no remains, either of elephants or mastodons, have been found north of the parallel of forty-eight degrees east of the Rocky Mountains. South of this line the remains are found in tolerable abundance over the whole surface of the eastern United States as far south as middle Alabama. We have not sufficient evidence of the distribution of the remains of these animals to determine just what range they had. New England has given us the fewest remains, only rare traces of the presence of this species having been found. In the valley of the Hudson they are tolerably abundant. In New Jersey, where the conditions favorable for their preservation are frequently found, some of the most perfect skeletons have been disinterred. All over the middle states we come across traces of this species; and in the West, they are the most abundant of mammal remains. On the Pacific coast, the fossil elephants were as numerous as in the Mississippi Valley; on this side of the continent they seem to have a greater northern range. The explorations of Mr. Dall revealed the existence of these remains as far north as Alaska; so that on the west coast at least, we have the remains of American elephants as far north as those of Siberia. The existence of these remains in Alaska makes it exceedingly probable that we shall find the similar fossils throughout British America, and that our mammoth is specifically identical with that of Asia. It is remarkable that the buffalo, which once ranged far east, and covered the whole of the plain region of the Ohio basin with innumerable herds, has not left as many traces of his presence as the elephants. The remains of the mastodon seem even more plentiful than those of the red deer. Something must, no doubt, be attributed to the greater size and solidity of the bones of these pachyderms over those of bison and deer. Still the remarkable abundance of the elephant remains is indubitable proof, not so much perhaps of the abundance of the individuals at any one time, as of the long continuance of the species on the soil. The buffalo was a temporary race on the Ohio Valley; he had probably been here only a few thousand years at most, possibly but a few hundreds, when the coming of the white man drove him beyond the Mississippi. He was not there at the time of the mound builders. His bones are not found among their remains. His striking form is not copied in their pottery, as are those of all other remarkable mammals of the valley. Nor do we find him delineated in the great figure mounds of the north-west; although if he existed in the region at the time when these people made these earthern monuments, he would have been sure of a prominent place among them. The elephants and mastodons, on the other hand, had a life which may possibly be reckoned by hundreds of thousands of years. A species was probably here before the glacial period; and since that time up to about the coming of man, possibly after his advent on the continent, they were continually present. The consequence is that their remains are found in about every spot where the conditions of their preservation exist. Almost any swampy bit of ground in Ohio or Kentucky where these huge creatures would have gotten mired in their efforts to get to water in dry seasons, or where the too yielding mud could have swallowed them up when they endeavored to cool themselves by wallowing in the mire, as is the habit of all elephants, contains more or less evidence of the presence of these animals. Sometimes a single tooth or tusk only has survived decay; at other times many skeletons are packed together in the bog. The numerous salt springs of the West, commonly called licks, are peculiarly rich in these remains. Like many other mammals these elephants were in the habit of seeking once a year, or oftener, some place where they could supply the hunger for salt. The saline waters, such as pour from Big Bone Lick, the upper and lower Blue Licks of Kentucky, or other similar localities in the West, supplied this need, and here came, on an annual pilgrimage, all the large animals of the country. When this region was first occupied by the whites the bones of elephants and mastodons were found in abundance upon the surface, or buried beneath a thin covering of mould around the various springs of the first of these localities. For nearly half a century they supplied every strolling curiosity hunter with relics, besides furnishing the remarkably perfect specimen in the British Museum, as well as half a dozen less complete skeletons. There remain to this day traces of the ancient paths on which at the time the country was settled the deer and buffalo thronged to their favorite watering place. These traces, broader than a wide bridle path and worn to the depth of several feet, were fifty years ago the natural roads, leading from great distances, down to the springs. The buffalo evidently fell into the paths made by their predecessors, the elephants; for along the courses of these paths the mammoth remains seem most abundant. Although some of the remains of the *Elephas primigenius* give evidences of extreme antiquity, others seem comparatively very recent. The author has a tooth of this species which came from the uppermost terrace of the alluvial plain opposite Cincinnati, at a point over sixty feet from the surface. This tooth could not have been placed in its position less than fifty thousand years ago. Since the deposition of the beds where it lay the Ohio has deepened its rock channel over fifty feet, and shrunk to the mere shadow of the mighty stream which flowed through its valley when it bore the melting ice of the drift period. On the other hand some of the remains of the same species, such as those which lie upon the surface at Big Bone Lick, are so well preserved as to seem not much more ancient than the buffalo bones which are found above them. There is a great difficulty in determining the relative antiquity of the two elephants which have existed in the United States since the glacial period. The *Elephas primigenius* (if the species be identical with the European representatives) seems on the whole to be more ancient than the *Mastodon Ohioticus.* It was beyond all question in existence when the upper terraces of our river bottoms were being formed, which must have been just as the ice sheet was passing away from the Alleghanies and was flooding our Western streams with its waters. This mastodon on the other hand seems never to be found under circumstances which indicate such great antiquity; it seems to have come in after the details of the river courses were about complete and all the terraces formed. There can be no doubt, however, that these two giants were associated during the latter part of their history. Although it is quite unusual for two allied animals of very great size to exist together in the same field, there is no reason why the Western world could not have been broad enough for both. There is sufficient difference in the structural features of these two races to warrant the supposition that they must have been characterized by considerable difference of habit and instinct such as would lead them to choose different fields of activity. It seems not unlikely, though the evidence is hardly sufficient to support the assertion, that the mastodon was most given to wandering in the swamps, while the elephant ranged on higher grounds.

The *Elephas primigenius*, or mammoth, was considerably taller than the Indian elephants of to-day, though not much exceeding them in length. The most striking differences of form were to be found about the head, which was considerably higher and more pointed than that of the Indian elephant, and provided with tusks, which instead of projecting downward and forward, curved quite abruptly outward and backward. The size of these tusks far exceeds those of any living elephant the author has measured; tusks of our North American mammoths have been found having a length on the outside of the curve of over ten feet, yet wanting both tips and bases. The perfect tusk must have been over eleven feet long. In addition to the greater length of the tusks the mammoth was distinguished from the elephants of to-day by the long hair which hung in a coarse mane from the neck and along the belly, nearly dragging on the ground. This shaggy envelope of hair must have added greatly to the apparent size and formidable appearance of this giant.

We know less about the appearance of the mastodon than the elephant proper. Their proportions were evidently not more widely different than those of our domesticated bull and the buffalo. The mastodons were probably never over eleven feet high. They had straight tusks, as have our modern elephants, their grinding teeth, which exhibit the most characteristic differences, separating them from their larger relatives, were fitted for the grinding of rougher food. From the extreme frequency of the occurrence of the remains of the mastodon in the swamps of the West, it seems likely that this form of elephant was peculiarly suited to exist in such regions.

There can be no doubt that a few thousand years ago these companion giants roamed through the forests and along the streams of the Mississippi Valley. They fed upon a vegetation not materially different from that now existing there. Replace them in the primeval forests of that region and their wants would be as well supplied as when they were lords of the domain. The fragments of wood which one finds beneath their bones seem to be of the common species of existing trees; even the reeds and other swamp plants which are imbedded with their remains are apparently the same as those which now spring in the soil. The naturalist, accustomed as he is to behold the mysterious changes of life, where races sink at once into a common grave, and the face of earth prepared for other actors in the great tragedy of existence, cannot but feel more keenly than before the temporary character of all life when he opens to the light of day the resting place of one of those species of gigantic animals. What could have been the nature of these agents which at one stroke drove from the face of earth two of the most powerful races of its inhabitants, sweeping with them many smaller forms, such as the extinct deer and bulls which we find buried with them. The unchanged geography of the country assures us that no great convulsion of nature brought it about. The similarity of the vegetation of the elephant period, with that now growing on the same soil, shows pretty conclusively that it was not due to great geographical changes of other regions reacting on the climate of the region they inhabited. It is not meant to assert that no changes of climate have taken place; on the contrary, such changes have most likely come about; but they have hardly been sufficient to extinguish animals so well adapted as the *Elephas primigenius* undoubtedly was to brave climatic irregularities.* There seems but one other way to explain the extirpation of these races and that is through the action of man. There is no longer any doubt that our ancestors of the stone age, on the European continent, were ushered on to earth in the midst of the gigantic animals of the elephant period. It is now over thirty years since Schmerling of Liege presented the evidence of the contemporaneity of the remains of man with those of the cave bear and other extinct animals. Step by step the evidence has accumulated, overwhelming the determined opposition of those who think that the truth they have is necessarily damaged by all new discoveries. It is impossible to present here the evidence which supports what may seem to many a too confident assertion; its character is known to most readers. Bones of these extinct animals, split for marrow and worked for tools, are probably the most important part of the evidence. But the most unquestionable bit of proof is that which is furnished by a fragment of a tusk of an elephant in the collection of M. Lartet, of Paris. Some artistic spirit of the stone age has commemorated an incident of the chase by graving upon this fragment a rude, but spirited representation of the animal to whom the tusk belonged. The form is very characteristic; the shape of head, such as the species is known to have had, differing considerably from that of the African elephant, is clearly shown. But one feature alone is sufficient to show that the savage meant to represent a member of the race to which the Lena elephant belonged; it is the long, shaggy hair, falling like a mane from the shoulders and neck and fringing the belly; this is clearly indicated in the engraving. But for the preservation of the Siberian elephants in ice we would have failed to perceive the meaning of this feature in the drawing; as it is it leaves no doubt that he who drew it had an *Elephas primigenius* in his mind's eye.

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* So far from a change from warmth to cold having been the cause of the extinction of the fossil elephants which have recently disappeared from the Mississippi Valley, all the evidence would warrant the conclusion that if change of climate was the agent at all, it likely acted by an alteration from cold to warmth, giving a climate too hot for a creature probably clothed as we know the Lena elephant to have been.

It was probably for the best that man should have come upon earth while these giants still lived. They were his teachers in the first arts of craft and courage. Having to dispute the possession of his primitive home, the caverns, with the gigantic cave bear, and the mastery of the forests with the formidable elephants, he was compelled to contrive weapons and use them with well concerted bravery. The magnitude of the dangers which surrounded him compelled him to associate himself with his fellow men, and his triumphs in struggles, where skill and valor prevailed against animal strength, gave him the first rude education of the combat.

If we must seek a reason for the death of the elephants in external influences we may well find it in the coming of man, though it would be quite as reasonable to suppose that their race already, as we have seen very ancient, passed away because it had lived its time and done its appointed work. We have no such evidence of the contact of man with this ancient race of giants on the continent of North America as European discoveries have afforded. No one who has examined the conditions of entombment of the extinct peoples of the Western states, the preservations of their remains, and the changes which have taken place since their deposition, can believe that the disappearance of the elephants, and the coming of the North American man were separated by any great length of time. When the fields of the West, rich in the remains of these ancient animals and ancient men, are studied as they will be by the rising generation of investigators of that region, the precise relation will be easily established. It is not likely that it will be found that the highly organized mound building nations were instrumental in driving the extinct elephants from the soil of North America. Had they come in contact with these large creatures we should have had some representation of them in their pottery sculpture, where we find figures of all the common large mammals of the West, except as before remarked, the bison, as well as other forms like the manatee which could not have been personally known to the inhabitants of the Ohio Valley. It is more likely to have been some rude dweller in caves of the stone age who slew the last mammoth of America.

The history of the changes in the elephant life, a little while ago so abundant, on three at least of the five continents, is not unlike what we find among other types of animals and plants which have passed the full meridian of their existence and are hastening to their setting. While the type is in its full vigor it spreads its diversified species far and wide over northern as well as southern lands; when it begins to wane the northern species fall first in the struggle, and the last remnants of the type are found beneath the torrid sun where easier conditions permit them to protract a senile life. Among the plants the palm and tree ferns; among the animals the large reptiles like the crocodiles and alligators, the rhinoceros, the hippotamus, the tapirs, the monkeys, and many other types find in the tropical forests the conditions of existence which the ruder climes of the north long since denied them. Our speculative friend asks, "may it not be that man, driven from the northern lands by the coming of his higher successor on the stage of life, is to finally end his race on earth within the recesses of the gloomy forests of Brazil or Borneo?"

THE MOLLUSKS OF OUR CELLARS.

BY W. G. BINNEY.

MOST of the readers of the NATURALIST, who reside in the cities of our Atlantic coast, are aware that the cellars of their houses are infested with slugs and snails. They have seen or heard of the glistening tracks made by their slime, and have heard dreadful stories of the ugly creatures who left them when escaping from their nocturnal depredations. But as few of our readers have met them face to face, we propose giving a short description of each with a portrait of sufficient accuracy to enable any one to identify the separate species.

A word first about their characters and habits. They all belong to the great division of mollusks which are called *Pulmonata*, from the fact of their breathing with lung-like vessels. Furthermore, they all belong to that group of *Pulmonata* which are called *Geophila*, or lovers of dry land, from the fact of their habits being terrestrial in distinction from those which are adapted to living in fresh-water, or in the sea. These *Geophila* are distinguished in addition to their breathing with lung-like vessels by their having their eyes at the end of long, slender, cylindrical feelers. Thus far most authors agree, but in subdividing these *Geophila* into natural groups there is so little accord among naturalists that we do not carry our readers farther in classification. Suffice it to say that literally from head to tail almost every